

No. 133,841.

T. A. EDISON.
Type Writing-Machine.

Patented Dec. 10, 1872.

3 Sheets--Sheet 1.

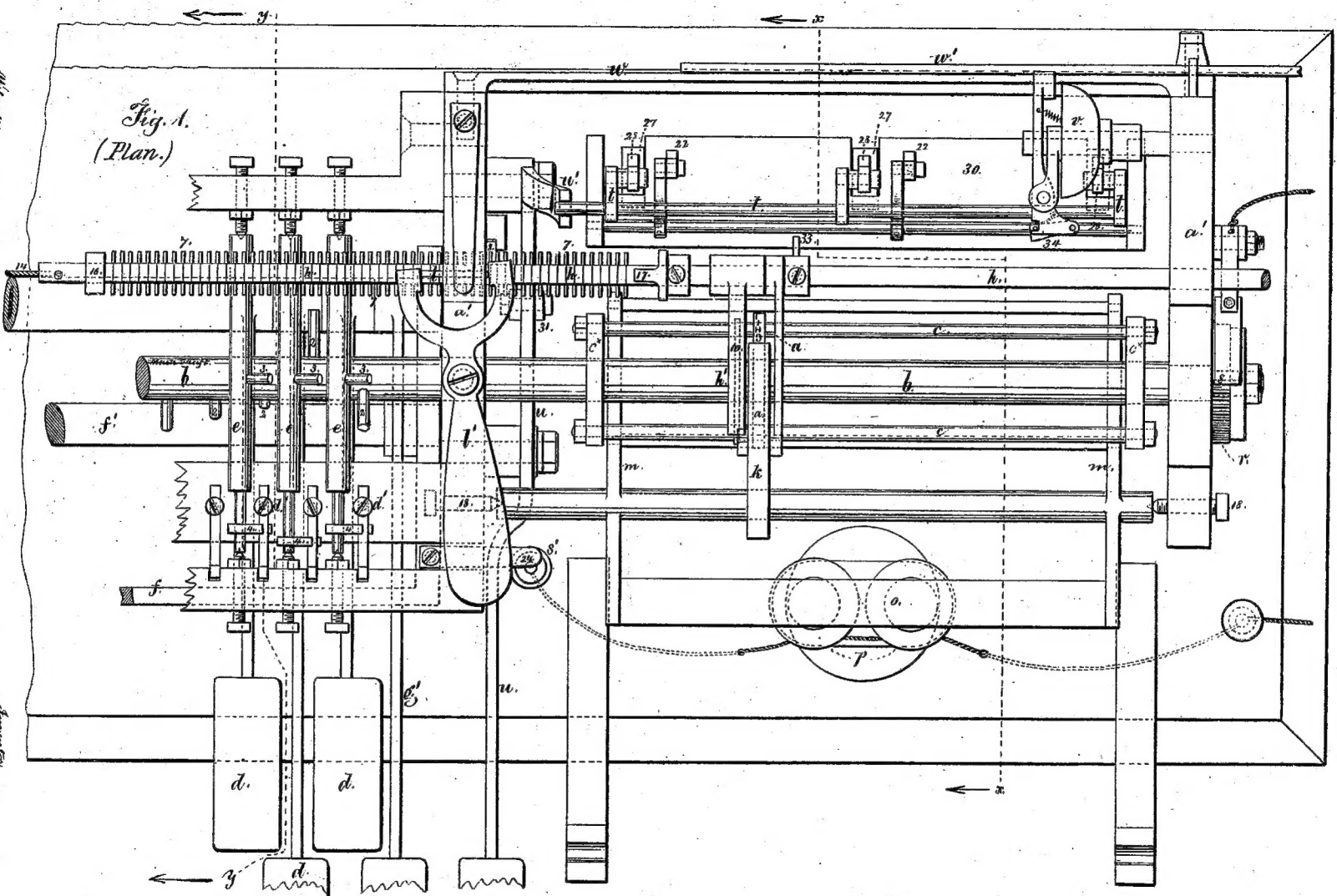


Fig. 1.
(Plan.)

Witness
Charles J. Smith
Jas. H. Watson

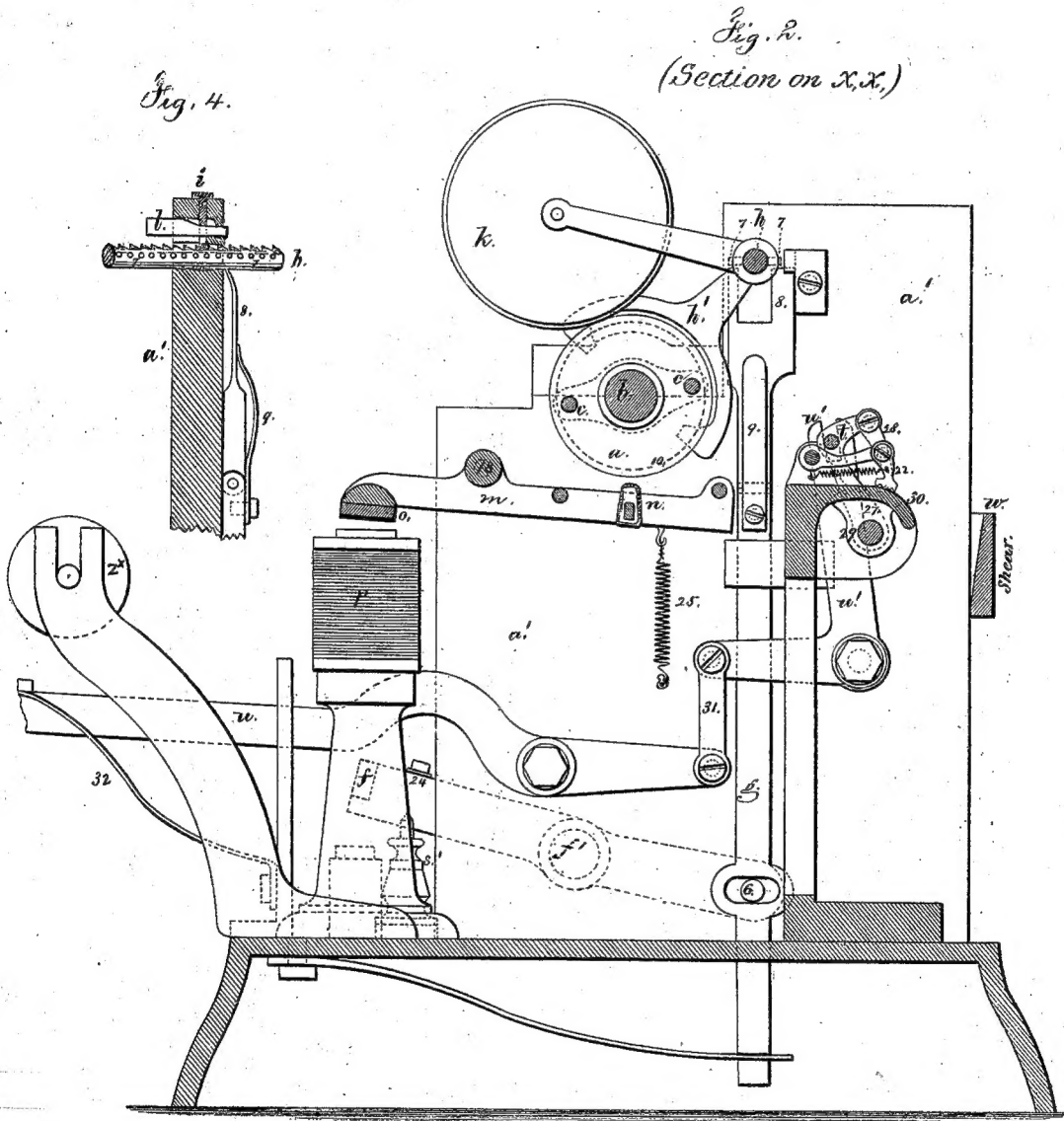
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Witnesses

Charles Smith

Geo. A. Warren

Thos. A. Edison
Lemuel W. Ferrell
att'y

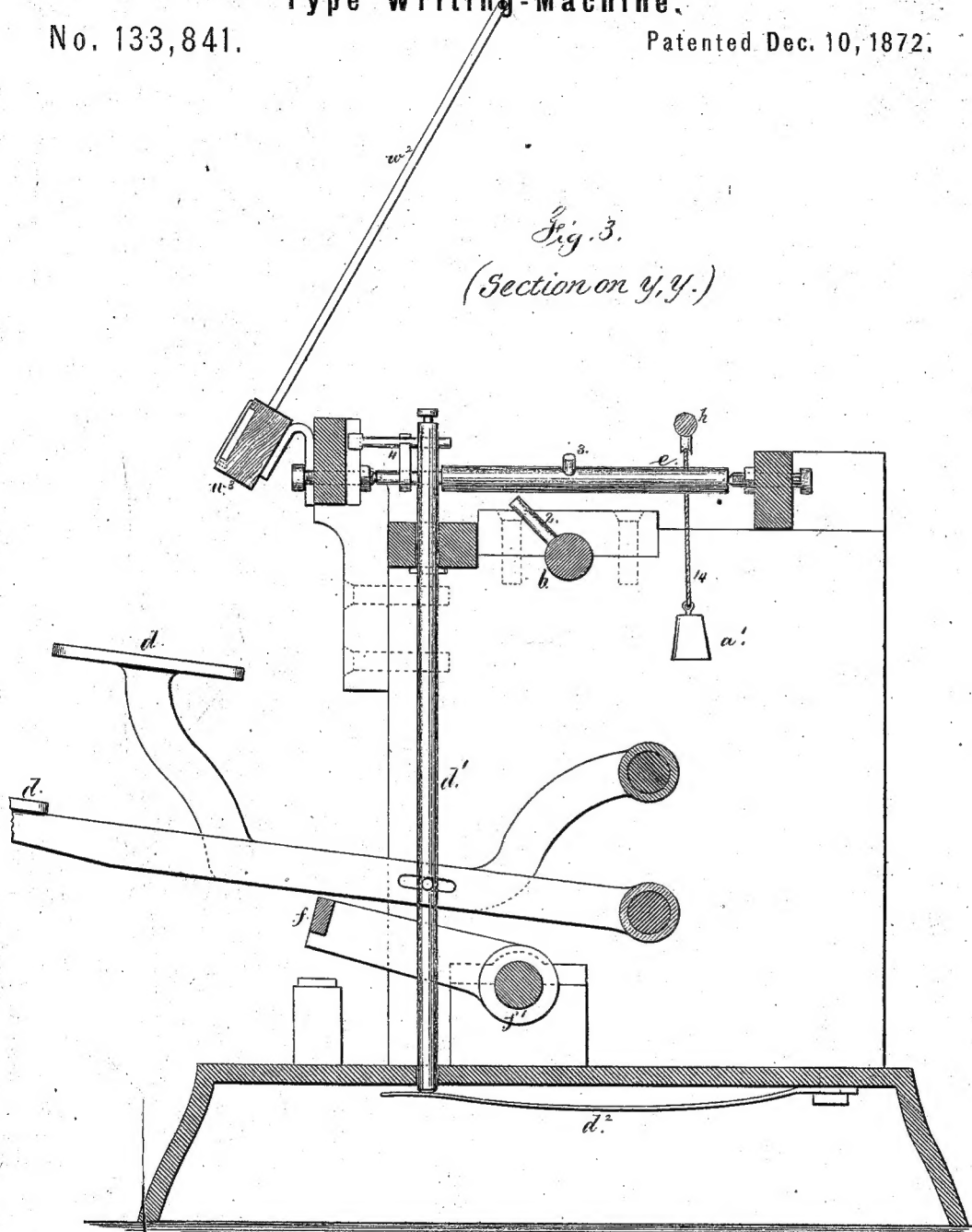
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Fig. 3.
(Section on y, y.)



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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF NEWARK, NEW JERSEY, ASSIGNOR TO HIMSELF
AND GEORGE HARRINGTON, OF WASHINGTON, D. C.

IMPROVEMENT IN TYPE-WRITING MACHINES.

Specification forming part of Letters Patent No. 133,541, dated December 10, 1872.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Newark, in the county of Essex and State of New Jersey, have invented and made an Improvement in Printing-Machines; and the following is declared to be a correct description of the same.

This invention is for printing by a type-wheel in a line upon a sheet or web of paper and then moving such paper along so as to print upon the line below. This invention is divided into the following principal features: First, mechanism for arresting a revolving type-wheel with the designated letter in position to be printed; second, the means for moving the type-wheel along between one impression and the next; third, mechanism for bringing the type-wheel back from the end of one line so as to commence at the beginning of the next; fourth, the devices for impressing the paper on the type-wheel; fifth, the feeding devices that move the paper the distance between one line and the next.

By moving the type-wheel along the line and across the paper the parts are simplified and rendered more compact than in those machines in which the paper has been moved; hence a roll or web of paper can be employed, and a telegraphic message printed thereon by hand, and cut off, instead of writing out the same, as now usual.

In the drawing, Figure 1 is a plan of the operative parts of the machine and part of the keys. Fig. 2 is a section at the line *x x*, near the type-wheel. Fig. 3 is a section at the line *y y*, representing the keys.

The type-wheel *a* is upon a sleeve that can be slipped endwise upon the shaft *b*. The guide-rods *c c* that are secured to heads upon the shaft *b*, and are parallel to such shaft, pass through holes in the type-wheel, and serve to rotate the type-wheel, but they do not interfere with the movement of the type-wheel and its sleeve endwise of the shaft by the means hereafter stated. The shaft *b* is of any desired length so as to pass over the range of finger-keys, and this range of finger-keys has the letters or characters corresponding to those on the type-wheel, and also the necessary keys for spaces between words and for moving the paper along from one line to the next. A pulley, continuously revolving by competent power, is applied to the shaft *b*, and an inter-

posed friction allows the wheel to continue its revolution while the shaft and type-wheel are stopped. Upon the type-wheel shaft *b* are projecting pins or blocks 2, arranged spirally, or positioned so that when the stop-pin 3 is brought into the path of such block 2 the shaft *b* will be arrested by such pin 3, with the letter or character corresponding with the key depressed in position for printing.

The means for moving the pin 3 by the key might be varied; but I have shown the key *d* as acting upon a vertical bar, *d'*, that has a pin acting in a cam-jaw, 4, upon the shaft *e* that carries such pin 3; hence, upon the depression of any one key the pin 3 connected with that key will be moved into the path of the block 2 upon the shaft *b*, and properly stop the type-wheel.

Springs *d''* are employed for raising the keys, and the key will rise slightly without liberating the block 2, in order that there may be time for the paper to be drawn away from the type, as hereafter described, before the type-wheel is again revolved. The finger-keys, for convenience, may be in two ranges, as shown. Beneath the range of finger-keys is a bar, *f*, supported by arms from the shaft *f'*, so that when any one of the finger-keys is depressed the bar *f* will be moved, and, by the arm and pin 6, operate the feeding-bar *g*, which is made as a forked inclined pawl, 8, (see Figs. 2 and 4,) at the upper end, that is pressed between the spacing-pins 7 on the rack-bar *h*, and moves such rack-bar and the type-wheel along one space each time a key is depressed, and a spring, 9, allows this pawl 8 to yield as the bar *g* descends, and then springs back so as to take behind the next spacing-pin. (See Fig. 4.) The lever *g'* is placed above, as a finger-key, or connected with the bar *f* so that the pawl 8 can be operated to move the rack-bar and type-wheel between one word and the next without striking either of the letter-keys *d*. The rack-bar *h* is made to slide in the frames *a'* *a'*, and is provided with a forked arm, *h'*, that sets over the edges of a disk, 10, that is connected with the type-wheel *a*, so that said type-wheel *a* will be free to revolve, but will be moved along upon the shaft *b*, as aforesaid, by the rack-bar *h*. This rack-bar *h* carries, also, the inking-roller or wheel *k* that supplies the necessary ink to the type. In the surface of the rack-bar *h* are notches, and a spring-pawl,

i, is provided to take into these and hold the rack-bar as moved along by the pawl 8. (See detached view, Fig. 4.) At one end of the rack-bar *h* a cord or chain, 14, is attached, passing over a pulley to a weight, and this weight is sufficient to draw the rack-bar and type-wheel along when the pawl *i* is raised. As the type-wheel reaches the end of the line a projection, 16, on the rack-bar *h* slides a wedge, *l*, under the pawl *i*, lifting the same and allowing the weight to draw the rack-bar and type-wheel back to the commencement of the line, and as this movement is finished the projection 17 moves the wedge *l* away from the pawl *i*, allowing said pawl to become again operative. This wedge *l* can be operated by the hand-lever *l'* so as to return the type-wheel to the beginning of the line between one paragraph and the next. The device for giving the impression consists in a padded bar, *n*, beneath the type-wheel, and set in a frame, *m*, that is hung on centers 18, and carries the armature *o* of the electro-magnet *p*, and this electro-magnet gives the impression whenever the type-wheel is stopped by the depression of a key. The electrical connections for this magnet consist of a break-wheel, *r*, revolved with the type-wheel *a*, and having as many conducting and non-conducting spaces as there are spaces on the type-wheel, and the spring-tooth *s* rests upon the same, and is in the electric circuit. This circuit passes, also, through the magnet, as shown in Fig. 1, and to the insulated post *s'*; and upon the end of the bar *f* there is a spring-finger, 24, that touches the end of this post *s'* when the key is depressed; hence the circuit will be closed at this point, but the electro-magnet *p* will not become charged until the type-wheel stops, because the break-wheel *r* opens and closes the circuit too rapidly; but when the type-wheel stops, the tooth *s* being on one of the conductors of that break-wheel, the circuit remains closed long enough for the magnet *p* to act and give the impression. The shaft *b* and bed of the machine form part of the electric circuit to the spring-finger 24. The circuit will be broken at *s'* as the key rises and before the type-wheel is allowed to revolve, so that the spring 25 may draw away the impression-bar and paper and prevent the printing being blurred. A suitable stop limits the motion. The feeding device that moves the paper along from one line to the next consists in the spring-pawls 28, hinged to a frame, *t*, that swings on the shaft 29, and said pawls hold the paper against the swinging segments 27 in moving such paper, but draw over the surface in the backward movement, the paper being held at this time by the pawls 22 against the stationary table or shield 30. The key *u*, connection 31, and lever *w* are used for moving the frame *t* and feeding the paper forward from the reel or drum *z*, and a spring, 32, returns the parts to their normal position. An alarm-bell, *v*, is employed to call the operator's attention to the line being finished, said

bell being struck at the last or nearly the last movement of the rack-bar *h*, by a projection, 33, moving the tail of the hammer 34. The operator moves the paper forward at the proper time by depressing the key *u*; or it might be done automatically by a connection from the rack-bar as the type-wheel is drawn along. In order to cut off a piece of paper upon which the printing has been done I provide a stationary shear, *w*, and swinging shear *w*¹, the latter being kept open by a spring so as not to interfere with the paper as it is fed along. A rack or stand, *w*², should be supported above the finger-keys on the frames *a'* *a'*, to hold the manuscript to be copied from, and a grooved bar, *w*³, Fig. 3, may also be provided in which a strip of paper may lie, this strip having upon it telegraphic characters in dots and dashes, either indented in the paper or made in colors in chemically-prepared paper, so that this may be drawn along in said bar as the message is printed.

I claim as my invention—

1. A type-wheel moved along in the line of its axis by a progressive movement between one impression and the next so as to print from such type-wheel in a line, substantially as set forth.

2. The rack-bar *h* and spacing-pins 7, in combination with the spring-pawl 8, key *d*, and type-wheel *a*, substantially as set forth.

3. The pawl 8, in combination with the rack-bar *h*, disconnecting device *i* *l*, and stops 16 and 17 upon such rack-bar *h*, substantially as and for the purposes specified.

4. The lever *l'* and disconnecting device *i* *l*, in combination with the rack-bar *h* and type-wheel *a*, substantially as set forth.

5. A pressure-bar sustaining the paper to be impressed below the line of printing, in combination with a type-wheel moved endwise of the axis, progressively, between one impression and the next, substantially as specified.

6. The break-wheel *r*, spring-finger *s*, and electric circuit and circuit-breaker 24 *s'*, in combination with the type-wheel, impression-bar, and electro-magnet, substantially as and for the purposes set forth.

7. The paper-feeding pawls 28 swinging with the segments 27 upon the shaft 29, in combination with the pawls 22 and stationary bed 30, as and for the purposes set forth.

8. A type-wheel and mechanism for moving the same in the direction of its axis between one impression and the next, in combination with impression mechanism and with a paper-feed actuated between one line of printing and the next, substantially as specified, so that printing can be done line after line across a roll or web of paper, substantially as set forth.

Signed by me this 13th day of November, A. D. 1871.

Witnesses:

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CHAS. H. SMITH,

GEO. T. PINCKNEY.